

INTISARI

Paparan sinar UVA merupakan penyebab utama penuaan kulit *photoaging* dengan cara meningkatkan jumlah ROS intraseluler. Peranan senyawa antioksidan diperlukan untuk mengatasi peningkatan jumlah ROS intraseluler tersebut. Kurkumin merupakan salah satu senyawa antioksidan yang terbukti menghambat kerusakan sel dan dapat menurunkan jumlah ROS intraseluler pada sel *Human Dermal Fibroblast* (HDF) yang diiradiasi sinar UVA. Heksagamavunon-5 (HGV-5) merupakan senyawa analog kurkumin yang juga memiliki aktivitas antioksidan, bahkan aktivitasnya lebih poten daripada kurkumin. Oleh karena itu, tujuan dari penelitian ini adalah untuk menganalisis aktivitas Heksagamavunon-5 (HGV-5) terhadap viabilitas sel dan jumlah ROS intraseluler pada sel *Human Dermal Fibroblast* (HDF) yang diiradiasi sinar UVA.

Senyawa HGV-5 diberikan pada sel HDF sebagai pra-perlakuan. Kemudian, sel HDF diiradiasi sinar UVA dengan dosis 3 J/cm^2 . Aktivitas sitotoksik dan sitoprotektif dari senyawa HGV-5 dalam beberapa seri konsentrasi diuji menggunakan metode *MTT assay*. Pengukuran absorbansi dilakukan menggunakan *ELISA reader*. Data absorbansi digunakan untuk menghitung persen viabilitas sel. Seri konsentrasi yang efektif digunakan untuk penentuan kadar ROS intraseluler dengan metode *flowcytometry-DCFDA*. Hasil analisis tersebut diolah dengan *Shapiro-Wilk Test*, *Levene Test*, *one-way ANOVA* dan *post hoc* dengan taraf kepercayaan 95%.

Senyawa HGV-5 pada konsentrasi 1, 2, dan $4 \mu\text{M}$ mampu memberikan proteksi pada sel HDF yang telah diiradiasi sinar UVA dengan menghasilkan persentase viabilitas sel masing-masing sebesar $90,94 \pm 2,60\%$, $90,65 \pm 3,08\%$ dan $106,46 \pm 0,44\%$. Senyawa HGV-5 pada konsentrasi $1 \mu\text{M}$ mampu menekan pembentukan ROS intraseluler lebih baik daripada vitamin E. Senyawa HGV-5 terbukti mampu memproteksi sel HDF dari sinar UVA sehingga berpotensi untuk dikembangkan menjadi agen anti-photoaging.

Kata Kunci: analog kurkumin, HGV-5, anti-photoaging, ROS, sel HDF, UVA

ABSTRACT

Exposure to UVA rays is the main cause of photoaging skin by increasing the amount of intracellular ROS. The role of antioxidant compounds is needed to overcome the increase in the amount of intracellular ROS. Curcumin is an antioxidant compound that has been proven to inhibit cell damage and can reduce the amount of intracellular ROS in Human Dermal Fibroblast (HDF) cells irradiated with UVA light. Heksagamavunon-5 (HGV-5) is a curcumin analogue compound which also has antioxidant activity, its activity is even more potent than curcumin. Therefore, the aim of this study was to analyze the activity of Heksagamavunon-5 (HGV-5) on cell viability and the amount of intracellular ROS in Human Dermal Fibroblast (HDF) cells irradiated with UVA light.

The HGV-5 compound is given to HDF cells as a pre-treatment. Then, HDF cells were irradiated with UVA light at a dose of 3 J/cm². The cytotoxic and cytoprotective activities of the HGV-5 compound in several concentration series were tested using the MTT assay method. Absorbance measurements were carried out using an ELISA reader. Absorbance data is used to calculate percent cell viability. The effective concentration series was used to determine intracellular ROS levels using the flowcytometry-DCFDA method. The results of the analysis were processed using the Shapiro-Wilk Test, Levene Test, one-way ANOVA and post hoc with a confidence level of 95%.

The HGV-5 compound at concentrations of 1, 2, and 4 µM is able to provide protection to HDF cells that have been irradiated with UVA light by producing cell viability percentages of 90.94 ± 2.60%, 90.65 ± 3.08% respectively. and 106.46 ± 0.44%. The HGV-5 compound at a concentration of 1 µM is able to suppress the formation of intracellular ROS better than vitamin E. The HGV-5 compound has been proven to be able to protect HDF cells from UVA rays so it has the potential to be developed as an anti-photoaging agent.

Key Word: curcumin analogue, HGV-5, anti-photoaging, ROS, sel HDF, UVA